

OXC-1545

Copy 4 of 5.

MEMORANDUM FOR : Deputy Director (Plans)
THROUGH : Acting Chief, Development Projects Division *5003*
SUBJECT : Hycon Proposal for "High Altitude Reconnaissance System Study"

25X1A 1. This is in response to your request for comments on the recently submitted Hycon camera proposal for Project OXCART. Three documents are attached: (1) a 6-page summation by Hycon of their proposal; (2) a brief note by [REDACTED] which recommends that Air Force undertake a prototype of this camera for A-12 application; and (3) a 283-page report of an Air Force-funded study by Hycon. This study was sponsored by Col. Geary's office with our prior knowledge. Our stipulation to the Air Force was that this study be directed to B-70 application and that absolutely no OXCART performance data, dimensions, etc., be transmitted to Hycon.

25X1D 2. The large Hycon volume, which I examined yesterday, is made up largely of a not up-to-date summary of available films, lenses, IMC sensors, shutters and similar hardware. Thirty-one pages, from page 200 to page 231, are devoted to a proposed aerial reconnaissance camera for a small vehicle referred to as X-15. However, the altitude [REDACTED], speeds [REDACTED], and diagrammed camera bay area (which appears to be that of the U-2), all bear little resemblance to the X-15.

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25X1D 4. Pages 232 to 235 contain a proposed camera system for a large vehicle such as the B-70. This likewise comes in two varieties, one a [REDACTED] focal length framing camera, and the other a [REDACTED] spotting camera along with two [REDACTED] focal length panoramic cameras.

25X1D 5. The characteristics of the camera system as finally proposed unofficially to us by Hycon are contained in their undated summary document. The essentials are [REDACTED]

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altitude. The attached chart summarizes the essential characteristics of the P-E, the EKC and the Hycon cameras on a comparable basis.

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6. I cannot, in going through the mathematics to determine expected ground resolution, verify the [REDACTED] claimed by Hycon under OXCART vehicle conditions. This should be, according to my estimate, in the order of [REDACTED] on the ground as compared to the P-E and EKC camera performances. In actuality, this camera appears to be a hybrid which neither follows the design philosophy of low density and long focal length, and consequent large size and heavy weight, nor does it follow the road of short focal length and high information density of the EKC and P-E designs. This is apparent in a comparison of the lens-film resolution for the three systems.

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7. The fact that P-E, EKC, and, quite long ago, Itek, all arrived at similar [REDACTED] systems I find to be the most persuasive argument against a camera of the variety proposed here by Hycon. The most serious potential mechanical problem is the very short cycle time required in a framing camera for this application. The Hycon camera would be required to take [REDACTED]

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This means that in that time film would have to be accelerated, stopped, drawn against the platen, the camera mirror cycled, all vibrations allowed to damp out, and the shutter triggered. Up to now, [REDACTED] has been a fair measure of the minimum cycle time for a framing camera and [REDACTED] is about the minimum time required for vibrations of various sorts to damp out. This camera as it is now proposed would not fit the OXCART vehicle. I believe that in forcing the optics into the available space we would lose focal length which means much reduced resolution unless a higher lens-film resolution is used. In this event, the system would enjoy all of the bad features of a framing camera plus the difficulties of the high information density philosophy. The cycle time of the P-E and Eastman cameras, incidentally, vary between [REDACTED]

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8. I would be very strongly opposed to any encouragement to Air Force to undertake this camera development on even a prototype basis for OXCART application. Even at best I am convinced such a design would be only slightly better than the modified "B" camera which [REDACTED] is now working on as a last resort system. The quotation contained in the Hycon summary of [REDACTED] for the prototype and [REDACTED] for [REDACTED] production units I find not attractive but rather an indication of insufficient depth of thought on the part of Hycon.

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Special Asst. for Technical Analysis
DPD-DD/P

3 Att:
Hycon System Study
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OXC-1544, cy 1